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CONTENTS:

THE NEW YORK MINERALOGICAL CLUB is a society organized in 1887 for the purpose of studying the rocks and minerals of the city and vicinity, which present many interesting and remarkable features. Very few persons have any idea of the number and variety of minerals that are found in the rocks of Manhattan Island and the immediate suburbs. But in some respects this locality is peculiar, for the reason that while a large amount of excavation and rock-cutting is all the time going on, yet scarcely is a deposit of minerals discovered in the progress of any such work, ere it is built over or filled up, and rendered forever inaccessible. New York Island specimens, therefore, possess in this aspect unusual interest, and the collection and preservation of them become a matter not only of scientific value, but of local pride. During a number of years past, a gentleman well known, and greatly respected in cultured circles here, Mr. Benjamin B. Chamberlin, has devoted a great amount of time, labor, and care to gathering these specimens from all parts of the city, wherever excavations were in progress. At the time of his death, in October last, he had thus secured the finest cabinet of New York minerals ever obtained. Mr. Chamberlin was not a man of wealth, and labored in this field out of pure love for science. The New York Mineralogical Club is very desirous to obtain this collection by purchase, that it may be retained in the city in its entirety, and serve as the foundation of a permanent local collection, which, for the reasons above given, must ever increase in value and interest as time goes on and the city is more and more built up. The moderate sum of fifteen hundred dollars will secure this very desirable object; and the trustees of the American Museum of Natural History have agreed to receive the collection on permanent deposit in their absolutely fireproof building, where it will always be accessible for purposes of study, — a monument to the zeal and success of its honored collector, and a matter of interest and credit to the metropolis.

SCIENCE IN THE SCHOOLS.

THE committee on the subject of science in the schools, of the American Society of Naturalists, consisting of Samuel F. Clarke (Williams College), William North Rice (Wesleyan University), William G. Farlow (Harvard University), George Macloskie (College of New Jersey, Princeton), and C. O. Whitman (editor *Journal of Morphology*), have made a report which has been accepted and heartily approved by the society. The committee have been retained, and have been granted full power to act for and with the society in the endeavor to establish what they have recommended.

From the steadily increasing demand of scholars, parents, and teachers for more and better instruction in these departments, the committee feel assured that the time is ripe for this movement, and that it only needs intelligent and concerted action to produce the results desired. The society will be represented at the meetings of the various educational associations in the country, and will make every effort to push the movement as vigorously as possible. It needs, however, and asks for, the active support and encouragement of every parent and teacher who believes that the young should have their natural tendencies, and longings for a knowledge of the things of nature, cultivated; their questions about things which are in every way pure and true answered; opportunities for enjoyment, and for friendships that will never fail, laid open to them; and, above all, the opportunity freely afforded them for securing the brain-growth and mental power, by observation and independent thought, which these studies are so peculiarly well fitted to give.

In regard to the general topic of science-teaching in the schools, the committee believe the following propositions fairly formulate the views which are held by the members of the society, and which the society should use its influence to diffuse: —

1. Instruction in natural science should commence in the lowest grades of the primary schools, and should continue throughout the curriculum.

2. In the lower grades the instruction should be chiefly by means of object-lessons; and the aim should be to awaken and guide the curiosity of the child in regard to natural phenomena rather than to present systematized bodies of fact and doctrine.

3. More systematic instruction in the natural sciences should be given in the high schools.

4. While the sciences can be more extensively pursued in the English course in the high schools than is practicable in the classical course, it is indispensable for a symmetrical education that a reasonable amount of time should be devoted to natural science, during the four years of the high-school course, by students preparing for college.

5. An elementary (but genuine and practical) acquaintance with some one or more departments of natural science should be required for admission to college.

Believing that the propositions stated above will command general acceptance, they are aware that there must be difference of opinion, among the members of the society and among intelligent educators in general, in regard to details, and that the precise subjects to be introduced into the curriculum must vary somewhat with the circumstances of different localities. They offer the following, not as necessarily the best scheme, but as a reasonable and practical scheme, which may at least serve to illustrate the general principles which they have formulated.

In the primary schools, and in the lower grades of the grammar schools, they recommend that the study of plants and animals should be the main part of the scientific work. The botanical

instruction should commence with such simple exercises as drawing and describing different forms of leaves, and should gradually advance to the easier and more conspicuous flowers, and later to the more obscure and difficult forms of flowers, the fruits and seeds.

The zoölogical instruction in the lower schools should not attempt a systematic survey of the whole animal kingdom, but attention should be directed chiefly to the most familiar animals, and to those which the pupils can see alive. The common domesticated mammals should first be studied, and later the birds, the lower vertebrates, the insects, crustacea, and mollusks. While the range of zoölogical instruction must be limited as regards the number of forms studied, those few familiar forms should be so compared with each other as to give the pupils, very early, some conception of the main lines of biological study, — morphology, physiology, taxonomy.

Special prominence should be given to the study of plants and animals which are useful to man in any way; and the teacher may advantageously, from time to time, give familiar talks in regard to useful products of vegetable and animal origin, and the processes of their manufacture.

Attention should also be given to the more obvious characteristics of the kinds of minerals and rocks common in the region in which any school is situated, and to such geological phenomena as are comparatively simple and easily observed.

A most important feature of the scientific instruction in the lower grades should be to encourage the pupils to collect specimens of all sorts of natural objects, and to make those specimens the subject of object-lessons. The curiosity of the children will thereby be rationally cultivated and guided.

The subject of human physiology and hygiene is of so immense practical importance, and so few comparatively of the pupils ever enter the high school, that we regard as desirable some attempt to teach the rudiments of the subject in the grammar, and even in the primary schools.

They recommend the introduction of exceedingly rudimentary courses in physics and chemistry in the highest grades of the grammar school, and further, as perhaps the most desirable branches of science to be included in the classical courses in the high school, and to be required for admission to college, physical geography, phænogamic botany, and human physiology. The first is suggested as tending to keep alive in the student's mind a sympathetic acquaintance with nature in its broader aspects; the second, as affording unequalled opportunities for discipline in observation; the third, as affording knowledge of the greatest practical importance.

The rudiments of physics and chemistry, which they propose for the grammar schools, will enable physical geography and physiology to be intelligently studied in the early years of the high-school course.

For the scholars in the English course in the high school, there will naturally be more advanced and systematic instruction in chemistry, physics, and zoölogy, and also instruction in geology and astronomy; but the classical students may with propriety leave these studies until they reach them in the college course. The scientific instruction they will have received in the primary and grammar schools, and the study of the three branches above specified in their high-school course, will be sufficient to preserve that natural and wholesome sympathy with nature the loss of which is now the main obstacle to the successful study of natural science in the colleges.

THE COAL QUESTION IN ENGLAND.

MR. R. Price Williams, M.Inst.C.E., read a paper on the "Coal Question" at the meeting of the Royal Statistical Society on Feb. 19. The following is an abstract of the paper as given in *Engineering*: —

After paying a well-deserved tribute to the labors of the late Professor Jevons in connection with this subject, the author shows, by a series of tabular statements and diagrams, the rapid increase in the coal-production of England prior and subsequent to the date of the coal commission in 1871. The Northumberland and Durham coal-field, as is pointed out, still gives to Newcastle its pre-eminence as the chief source of the coal-supply, the output last year from Durham alone amounting to over 28,750,000 tons, or to more than one-sixth of the total production in the United Kingdom. Attention is drawn to the fact that during the last four or five years there has been a considerable decrease in the output from these northern coal-fields; and the maximum limit of the coal-production it is considered has been reached, and henceforward it will continue to decline. It is shown, that, at the average rate of increased production during the last twenty-two years, the 9,294,000,000 tons of available supply would be entirely exhausted in about ninety-four years.

The author devotes a considerable part of his paper to the South Wales coal-field, — a district he is well acquainted with, — and attention is directed to the remarkable development which has occurred during the last few years in the South Wales steam coal-trade, the 26,000,000 tons produced last year coming next in amount to that of Durham. This large quantity is shown (after allowance is made for waste in working) to represent about 5,381 acres of a four-foot-thick coal-seam practically worked out in the course of a single year. The total available supply in the South Wales coal-basin is estimated by the coal commissioners at 36,566,000,000 tons, or just one-third of the whole available supply in the United Kingdom, which, at the rapid rate of increased production which has obtained during the last quarter of a century, would, as the author shows, be entirely exhausted in the short space of seventy-nine years.

The rapid development in the coal-production in the eastern division of this coal-field, which contains the famous steam coal-measures, is strikingly shown by the enormous growth of the coal-exports from Cardiff, more especially to foreign countries. In 1864 these only amounted to 1,500,000 tons, doubled in the next ten years, and again doubled in the following seven years; while in 1887 they amounted to 8,250,000 tons, or to more than a third of the entire coal-exports for the United Kingdom for that year.

Two-thirds of the South Wales coal-supply is obtained from Glamorganshire, more particularly from the eastern division, containing these valuable steam coal-seams. The author shows, that, if the production from this eastern portion of the coal-basin continues to increase at the average rate it has done during the last twenty-four years, the whole available supply, which the coal commissioners estimated at 12,963,000,000 tons, will be entirely worked out in the course of the next sixty years; and the portion containing the lower or steam coal-seams, in the short space of forty-two years.

The coal exported from Cardiff, consisting chiefly of this high class of coal, the author points out, represents, after making allowance for waste in working, about seven acres of the famous four-foot steam coal-seam entirely worked out during each working day of the year.

The coal-productions from all the other principal coal-fields are separately dealt with; and the dates at which, at the average increased rate of output during the last twenty-four years, they will become exhausted, are given in the following summary: —

	Years.
Northumberland and Durham	94
South Wales	79
South Wales (eastern division)	46
Lancashire and Cheshire	74
Yorkshire, Derbyshire, and Nottingham	90
Warwickshire	53
Denbighshire and Flintshire	250
Scotland	92
United Kingdom	102

Under the head of coal-consumption, particulars are given of the chief uses to which the coal is applied, from which it appears that the coal consumed in the manufacture of pig iron, and in the manufacture of merchant iron and steel of various kinds, amounted at the time of the coal commission to nearly one-third of the coal produced in the United Kingdom. The large economies since effected by the Bessemer, Siemens, and other processes, are shown, however, to have reduced the consumption in 1887 to little more than 16 per cent of the coal-production. Attention is drawn to the large economies effected and to be effected by the use of compound